

CLAIMS

1. Process for the investigation and display of tissues of human or animal origin, in which:

5 - an ultrasound probe (1) is positioned, said probe being carried by a head steered by means of a three-dimensional positioning system (2), in particular controlled by a computer (3) at right angles to the said tissue structures,

10 - the probe is controlled such that it generates ultrasound wave beams,

- the tissue structures are scanned by the said positioning system, which carries out a parallel acquisition of the signals reflected by the tissue  
15 structures, and

- the signals from the data derived from scanning are processed, this process being characterised in that the ultrasound waves generated are convergent, high frequency waves whose nominal frequency is included 20 within the range from 30 to 100 MHz with a large pass band, adapted to the frequencies reflected by the investigated structures, these waves being focused on a given zone of the tissue structures over a vertical penetration distance of between 20 and 30 mm.

25 2. Process according to Claim 1, characterised in that it is applicable to the investigation of a posterior segment of an ocular globe.

30 3. - Process according to either of Claims 1 and 2, characterised in that it is applicable to the investigation of an anterior segment of an ocular globe.

35 4. - Process according to any one of the preceding Claims, characterised in that it is applicable to the investigation of a human ocular globe.

5. - Process according to any one of the preceding Claims, characterised in that it is applicable in gynaecology and obstetrics, in gastro-enterology and in the field of cardio-vascular examinations and

examinations by coelioscopy, or in dermatology and more generally in any medium which reflects a usable signal.

6. System for the implementation of the process according to any one of the preceding claims,  
5 comprising an ultrasound probe (1) mounted within a head articulated in three dimensions, controlled by a computer (3), in a direction in particular perpendicular to the medium to be investigated, characterised in that the probe (1) consists of a transducer, controlled by a transmitter/receiver (4),  
10 in order on one hand to generate and to focus the convergent, broad band, ultrasonic wave beams, using an electronic or digital focusing device over a vertical distance of between 20 and 30 mm, in the direction of  
15 the tissue structures to be scanned and investigated, by means of a coupling medium (6), and on the other hand to collect the signals reflected by the said structures for the purposes of processing in particular by the computer (3) with a view to subsequent  
20 interpretation.

7. System according to Claim 6, characterised in that the focal distance of the ultrasound probe (1) is modified by an electronic or digital device in order to adjust the focus point of the said probe.

25 8. System according to Claim 6, characterised in that the focal distance of the ultrasound probe (1) is modified mechanically by the servo-controlled positioning system (2).

9. System according to Claim 6, characterised in  
30 that the computer (3) steers the motors step by step in order to ensure the movement of the probe (1) and the scanning of the ultrasound beams over the tissue structures by a step ( $R$ ,  $\delta$ ), using a probe support head which allows an arciform scan.

35 10. System according to Claim 6, characterised in that the computer (3) steers the motors step by step in order to ensure the movement of the probe (1) and the scanning of the ultrasound beams over the tissue

structures by a step .(X,Y,Z), using a probe support  
head which allows a cartesian scan.